8-2-95

ZB

DP Barcode : D210555
PC Code No : 035302
EEB Out :

To: Kathryn Davis
Chemical Review Manager 52
Special Review and Reregistration Division (7508W)

From: Anthony F. Maciorowski, Chief
Ecological Effects Branch/EFED (7507C)

Attached, please find the EEB review of...

Reg./File # : 035302-000264
Chemical Name : Bromoxynil octonoate
Type Product : Herbicide
Product Name : Bromoxynil and Esters
Company Name : Rhone-Poulenc Ag Company
Purpose : Submission of mysid acute toxicity data to support reregistration of List B, Case No. 2070.
Action Code : 606 Date Due : 05/03/95
Scientist : Date In : 01/11/95

EEB Guideline/MRID Summary Table: The review in this package contains an evaluation of the following:

GDLN NO	MRID NO	CAT	GDLN NO	MRID NO	CAT	GDLN NO	MRID NO	CAT
71-1(A)			72-2(A)			72-7(A)		
71-1(B)			72-2(B)			72-7(B)		
71-2(A)			72-3(A)			122-1(A)		
71-2(B)			72-3(B)			122-1(B)		
71-3			72-3(C)	434876-01	S	122-2		
71-4(A)			72-3(D)			123-1(A)		
71-4(B)			72-3(E)			123-1(B)		
71-5(A)			72-3(F)			123-2		
71-5(B)			72-4(A)			124-1		
72-1(A)			72-4(B)			124-2		
72-1(B)			72-5			141-1		
72-1(C)			72-6			141-2		
72-1(D)						141-5		

Y=Acceptable (Study satisfied Guideline)/Concur
P=Partial (Study partially fulfilled Guideline but additional information is needed
S=Supplemental (Study provided useful information but Guideline was not satisfied)
N=Unacceptable (Study was rejected)/Nonconcur

100.0 Pesticide Name:

Bromoxynil Octanoate

100.3 Submission Purpose:

Submission of 96-hour LC_{50} study for mysid shrimp

101.0 Chemical and Physical Properties:

101.1 Chemical Name:

Bromoxynil Octanoate

101.2 Common Name:

Bromoxynil Octanoate

103.0 Toxicological Properties:

96-hour LC_{50} for mysid shrimp = 0.065 mg ai/L

105.0 Conclusions:

This study appears to be scientifically sound and it does not fulfill the guideline requirements for an acute toxicity test on mysid shrimp. The 96-hour LC_{50} was 0.065 mg ai/L, which classifies Bromoxynil Octanoate as being very highly toxic to mysid shrimp. 8-10-9 CEL

Curtis E. Laird 8-1-95
Curtis E. Laird, Fishery Biologist
Ecological Effects Branch
Environmental Fate and Effects Division (7507C)

Norman J. Cook 08.02.95
Norman J. Cook, Head-Section #2
Ecological Effects Branch
Environmental Fate and Effects Division (7507C)

for 8/2/95
Anthony F. Maciorowski, Chief
Ecological Effects Branch
Environmental Fate and Effects Division (7507C)

DATA EVALUATION RECORD

1. CHEMICAL: Bromoxynil Octanoate

2. TEST MATERIAL: 94.9% TGAI, an amber waxy solid-nonradiolabeled TGAI
98.2% TGAI, ^{14}C bromoxynil octanoate - radiolabeled TGAI

3. STUDY TYPE: §72-3(c)

4. CITATION:

Author:	Machado, Mark W.
Title:	Bromoxynil Octanoate - Acute Toxicity to Mysids (*Mysidopsis bahia*) Under Flow-Through Conditions
Date:	14 November 1994
Laboratory Report #:	94-10-5502
Any Other Study #:	10566.0894.6344.515
Sponsor:	Rhone-Poulenc Ag Company
Sponsor #:	
Laboratory:	Springborn Laboratories, Inc. 790 Main Street, Wareham, MA 02571-1075
MRID No.:	434876-01

5. REVIEWED BY:

Curtis E. Laird, Fishery Biologist Signature: Curtis E. Laird
Ecological Effects Branch
Environmental Fate and Effects Division (7507C) Date: 7-19-95

6. APPROVED BY:

Norman J. Cook, Chief, Section 2 Signature: Norman J. Cook
Ecological Effects Branch
Environmental Fate and Effects Division (7507C) Date: 07.31.95

7. CONCLUSION

This study appears to be scientifically sound and does not 8-10-95 CEL fulfill the guideline requirements for an acute toxicity test on mysid shrimp. The 96-hour LC_{50} was 0.065 mg ai/L, which classifies Bromoxynil Octanoate as being very highly toxic to mysid shrimp.

8. RECOMMENDATIONS

9. BACKGROUND This study was submitted in support of reregistration.

10. MATERIALS AND METHODS

A. Test Organisms: Mysid Shrimp

Guideline Criteria	Reported Information
Species (Scientific Name)	*Americamysis bahia*
Mean Weight (> 0.5 grams)	≤ 24 hours old
Supplier	Springborn Laboratories brood stock Lot Number 93Ab
All shrimp from same source (yes or no)	yes
All shrimp from the same year class (yes or no)	yes
Other Comments	N/A

B. Source/Acclimation

Guideline Criteria	Reported Information
Acclimation Period (minimum 10 days)	Information not available
Wild caught 7 day quarantine (yes or no)	no
Check for signs of disease or injury (yes or no, if yes describe)	Information not available
If diseased it can be treated in 48-hr pretest no sign of the disease remains (Report hours prior to test in which no sign of disease or N/A)	N/A
No feeding during the study (When last fed)	Fed throughout the study
<3% mortality 48 hours prior to testing (% mortality, if any)	Information not available

C. Test System:

Guideline Criteria	Reported Information
Describe source of dilution water	Seawater collected from Cape Cod Canal, Bourne, MA

Does water support test animals without observable signs of stress?	yes
What was the salinity of the water used? (30-34% ppt for marine (stenohaline) shrimp and 10-17% ppt for estuarine (euryhaline) shrimp.	31-32%
Water Temperature (22°C)	25 ± 1°C
pH 8.0-8.3 marine (stenohaline) shrimp 7.7-8.0 estuarine (euryhaline) shrimp	7.8-8.0
Dissolved Oxygen (Static 1st 48 hrs 40%; 2nd 48 hrs 60%; Flow-through 60%) (% of lowest conc. & hour)	≥ 6.0 mg/L throughout study
Total Organic Carbon	1.4 mg/L
Test Aquaria 1. Material (glass or stainless steel) 2. a. Static volume (18.9 L (5 gal or 19000 cc) with 15 L solution) b. Static or flow-through volume (300x600x300 = 54000 cc.)	11.0 glass aquaria flow-through 39 X 20 X 25 cm
Type of Dilution System. (Reproducible supply of toxicant)	yes
Flow rate Consistent flow rate-meter systems calibrated before study and checked 2*24 hours - 5 to 10 vol/24 hours	6.5 volume replacements per 24 hours
Biomass Loading Rate (Static no > 0.8 g/L ≤ 17°C; >17°C 0.5 g/L; Flow-through 1 g/L/24	0.00014 g biomass/L
Photoperiod (16 L & 8 D)	16 light and 8 dark

Solvents 1. (Do not exceed 0.5 ml/L for static tests) 2. (Do not exceed 0.1 ml/L for flow-through)	0.096 ml/L (acetone)
Other Comments	

D. Test Design:

Guideline Criteria	Reported Information
Range Finding Test (LC_{50} >100 mg/L with 30 shrimp, no definitive test required.)	0.039, 0.11, 0.30 mg ai/L 100% mortality at 0.11 and 0.30 mg ai/L after 48 hours of exposure.
Definitive Test	
Nominal Concentrations (control+5 treatment levels; dosage should be 60% of the next highest concentration; concentrations should be geometric series)	0.031, 0.040, 0.072, 0.092 and 0.16 ppm ai mean measured concentrations. Nominal concentrations were: 0.023, 0.039, 0.065, and 0.18 ppm ai, respectively.
Controls (Minimum control mortality; static 10%; flow-through 5%	0%
Number of Test Organisms; (Minimum 20/level can be divided among containers)	20 /test concentration and control
All organisms must be randomly assigned to test vessels. (yes or no, describe if no)	yes
Biological Observations (yes or no)	yes
Water Parameter Measurements 1. Temperature - record every 6 hrs;>1°C. 2. D.O. beginning,48 hrs,end for control high, medium, and low dose. 3. pH beginning,48 hrs, end for control, high, medium, and low dose.	Temp. continuously measured in 1 control replicate. Temp. measured in all other test and control vessels daily. For DO and pH see Table 1

Chemical Analysis (needed if aeration, volatile, insoluble, precipitate, not steel or glass, known to adsorb, and flow-through) (yes or no)	No visible signs of undissolved test material
Other Comments	Stock solution preparation consisted of combining ^{14}C bromoxynil octanoate and nonradiolabeled bromoxynil octanoate in appropriate amount to deliver nominal concentrations.

11. REPORTED RESULTS:

Guideline Criteria	Reported Information
Mean Measured Concentrations (report conc.)	0.031, 0.040, 0.072, 0.092, and 0.16 ppm ai
Recovery of Chemical (% recovery)	Mean measured concentrations, based on analysis for ^{14}C-Bromoxynil octanoate, indicated that measured concentrations were 87 - 140% of nominal concentrations. It was noted that at the 0.065 mg ai/L nominal concentration that an increase in test material from 0-hour (0.053 mg ai/L) to 96-hours (0.091 mg ai/L) was observed. Therefore, the o-hour (0.053 mg ai/L) value was considered the more conservative estimate and was used by the author in calculating the LC_{50} values.
Mortality & Observations (Describe observations & attach mortality tables)	See Table 3
Author's Comments	

12. STUDY AUTHOR'S CONCLUSIONS / QUALITY ASSURANCE MEASURES:

No conclusions were made.

Quality assurance and good laboratory practice statements were included in the report, indicating that the study was conducted in accordance with U.S. EPA Good Laboratory

Practices Regulations set forth in FIFRA 40 CFR Part 160.

13. REVIEWER'S DISCUSSION AND INTERPRETATION

A. Test Procedure:

The following items did not meet the guideline criteria:

1. No information was given on the test species with respect to size, acclimation period, health, etc.

B. Statistical Analysis

Guideline Criteria	Reported Information
Binomial (yes, no, or not reported)	yes, LC_{50} and confidence intervals were calculated. LC_{50} = 0.072 ppm ai and 95% CI 0.04 - 0.092 ppm ai.
Moving Average Angle (yes, no, or not reported)	LC_{50} = 0.069 (0 - infinity) ppm ai
Probit (yes, no, or not reported)	LC_{50} = 0.065 (0.0566 - 0.075) ppm ai
Other Comments -- study used nonlinear interpolation	LC_{50} = 0.065 ppm ai

C. Discussion/Results:

This study appears to be scientifically sound and it does not fulfill the guideline requirements for an acute toxicity test on mysid shrimp. The 96-hour LC_{50} was 0.065 mg ai/L, which classifies Bromoxynil Octanoate as being very highly toxic to mysid shrimp. Although the study authors believe the NOEC to be 0.040 mg ai/L, EEB concludes the NOEC is < 0.031 mg ai/L because mortalities occurred at both 0.031 mg ai/L and 0.04 mg ai/L.

D. Adequacy of the Study:

1. Classification: Supplemental

2. Rational: Lack of information on the test species.

3. Reparability: Yes, if information is provided.

14. COMPLETION DATE OF ONE-LINER FOR STUDY:

Laird Bromoxynil Octanoate 96-Hour LC50 For Mysid Shrimp

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CONC.	NUMBER EXPOSED	NUMBER DEAD	PERCENT DEAD	BINOMIAL PROB. (PERCENT)
.16	20	20	100	9.536742E-05
.092	20	17	85	.1288414
.072	20	10	50	58.80985
.04	20	1	5	2.002716E-03
.031	20	2	10	2.012253E-02

THE BINOMIAL TEST SHOWS THAT .04 AND .092 CAN BE
USED AS STATISTICALLY SOUND CONSERVATIVE 95 PERCENT
CONFIDENCE LIMITS, BECAUSE THE ACTUAL CONFIDENCE LEVEL
ASSOCIATED WITH THESE LIMITS IS GREATER THAN 95 PERCENT.

AN APPROXIMATE LC50 FOR THIS SET OF DATA IS .072

RESULTS CALCULATED USING THE MOVING AVERAGE METHOD

SPAN	G	LC50	95 PERCENT CONFIDENCE LIMITS
4	16.79437	6.883989E-02	0
			+INFINITY

RESULTS CALCULATED USING THE PROBIT METHOD

ITERATIONS	G	H	GOODNESS OF FIT PROBABILITY
3	9.899429E-02	1	.1905533

SLOPE = 5.611263
95 PERCENT CONFIDENCE LIMITS = 3.845771 AND 7.376754

LC50 = 6.530042E-02
95 PERCENT CONFIDENCE LIMITS = 5.660248E-02 AND 7.532691E-02

LC10 = .038778
95 PERCENT CONFIDENCE LIMITS = 2.905028E-02 AND 4.615727E-02

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